Requirement Title	Requirement Definition	Challenge Requirement
Maximum Gross Takeoff Weight	The Maximum Gross Takeoff Weight (MGTW) is the maximum allowable takeoff weight for the UAS. This includes everything that is on board or otherwise attached to the aircraft.	The UAS must have a MGTW less than 55 pounds.
Total System Weight	Total System Weight is the weight of the entire system (to include UAS, Ground Control Station, spares, fuel, transceiver, payload server, and storage).	Total System Weight shall not exceed 120 pounds.
System Cost	System cost is the total cost of all components of the system to include (software, hardware, transceiver, spares, and custom-made items), with exception of the RTK-GPS. All components are listed in the BOM.	The system cost shall not exceed $20,000.
Degraded Takeoff/ Landing Capability	A degraded takeoff/landing area is an area that is typically unsuited for standard flight operations. The area can be small, uneven, and does not have a conventional runway.	The UAS shall be capable of vertical takeoff and landing (VTOL) and must be able to operate in a degraded takeoff/landing area.
Hover	Hover is the ability of the UAS to remain suspended over a place or object.	The UAS shall be able to hover within a sphere with a radius of 30 meter centered at a defined position and altitude in space for as long as possible.
Level of Autonomy	Level of Autonomy refers to the spectrum of independence that the UAS can operate.	The UAS must be capable of complete auto takeoff/landing and waypoint navigation.
Wireless Transceiver	A wireless transceiver is a device that can communicate with a user's smartphone, or User Equipment (UE).	The UAS must be equipped with a wireless transceiver capable of transmitting internet protocol (IP) based data to several first responder UE while in the air. UE used for the test will be a Samsung Galaxy S10, an iPhone 11, and a Google Pixel 4.
Payload Server	The payload server is a small computer located on the UAS that connects to the wireless transceiver. The payload server measures the throughput from the UAS to UE on the ground and will potentially hold files to be transmitted. The payload server will be provided to Contestants by the NIST Challenge team.	This server requires an ethernet connection to the wireless transceiver and a power source from the UAS. The server will require a 5 volt, 15 Watt power source. The UAS shall be capable of hosting this payload which will weigh no more than 0.2 kg and be no larger than 14 x 8 x 8 cm. NIST reserves the right to alter the server payload weight, size, and power source.
Real-Time Video	Real-time video is the ability to provide full motion video to the ground control station during anticipated mission operations.	The UAS shall provide real time full motion video to the ground control station at a minimum resolution of 1280 X 720 progressive (720p).
GPS	GPS is a global navigation satellite system (GNSS) providing geolocation and time information to a GPS receiver.	The UAS shall be equipped with a Global Position System.

RTK-GPS	A real-time kinematic (RTK) global positioning system (GPS) enhances the accuracy of satellite-based positioning using corrections broadcast in real-time to a roving GPS receiver from a ground-based stable GPS receiver.	The UAS shall be equipped with an RTK-GPS and stable ground station that is broadcasting the differential GPS corrections. Note that the cost of the RTK-GPS will not be factored into scoring nor will it be factored into the minimum system cost requirement.
UAS Insurance	UAS (liability) insurance covers damage to third party property and injury to other people.	The team shall have UAS (liability) insurance or demonstrate financial responsibility with a minimum coverage of $1M prior to conducting any flights outside of an enclosed test facility.
Tethers	A tether is a physical connection between the drone and the ground that can provide power and communications and/or can be used to simply attach the drone to the ground.	The system shall not have any tethers and must be free flying.
Flight termination system (FTS)	The FTS is a subsystem that is able to immediately cut power to all of the UAS motors at once when activated or initiates an inverted dive for a horizontal flight aircraft. Activation shall be possible for the following: 1. If the UAS passes a geofence set by the Contestant. 2. If the UAS is disconnected from the flight controller for a set amount of time. 3. To allow for a "kill" command to be sent to the UAS via the controller.	The UAS shall be equipped with an FTS (i.e., a Kill Switch) that when activated cuts power to all motors. Specific configuration for the FTS and geofence will be defined by the NIST Challenge team.